

R E M A R K S

Claims 5, 7-10, 16 and 18-20 were rejected under 35 USC 103 as being obvious in view of the combination of USP 6,744,910 ("McClurg et al") and JP 2001-184490 ("Horinouchi"). This rejection, however, is respectfully traversed, and reconsideration of this application is respectfully requested.

On pages 2-3 of the Office Action, the Examiner asserts with respect to independent claim 5 that McClurg et al discloses (i) a pixel value detecting unit which detects a respective maximum value and a respective minimum value from fingerprint image data output from each of the image pickup elements, and (ii) a pixel value range detecting unit which detects a pixel value range between the respective maximum value and the respective minimum value detected by the pixel value detecting unit for the fingerprint image data read by each of the image pickup elements. As support, the Examiner cites column 7, line 53 to column 8, line 5 of McClurg et al. Independent method claim 16, moreover, has been rejected for the same reasons as claim 5.

As acknowledged by the Examiner, McClurg et al does not disclose a line sensor for scanning a fingerprint. For this reason, the Examiner has cited Horinouchi as disclosing the use of a line sensor.

It is respectfully pointed out, however, that since McClurg et al does not disclose a line sensor (as acknowledged by the

Examiner), in the structure disclosed in McClurg et al, a single image pickup element does not pick up a plurality of pixels of a fingerprint (in the manner of the line sensor recited in claim 5). Therefore, McClurg et al clearly cannot disclose or suggest detecting a respective maximum value and a respective minimum value from fingerprint image data output from each of the image pickup elements, or detecting a pixel value range between the respective maximum value and the respective minimum value detected by the pixel value detecting unit for the fingerprint image data read by each of the image pickup elements.

That is, McClurg et al does not disclose a structure in which a range of pixels of fingerprint data are acquired by each one image pickup element as recited in claim 5 (see the Figs. 17 and 18 of the present application, for example), and therefore clearly cannot disclose detecting maximum and minimum values and a range with respect to fingerprint image data output from each one image pickup element in the manner recited in claim 5. And it is respectfully submitted that McClurg et al also does not disclose the corresponding method recited in claim 16.

Indeed, according to McClurg et al the two-dimensional image sensor must be normalized prior to scanning a fingerprint by applying a uniform light source. That is, according to McClurg et al, Fig. 5A illustrates the normalization technique performed during manufacturing of the sensor. The normalization process

shown in Fig. 5A includes exciting the image sensor with a uniform light source in step 510 to obtain a normalization image as shown in Fig. 3A. An average sensitivity associated with the image sensor is obtained in step 520, and an average image sensitivity of each column is determined in step 530. Then a set of image normalization coefficients is determined in step 540, and the image normalization coefficients are stored in step 550 for use during device operation. See column 5, line 23 to column 7, line 3 of McClurg et al.

It is respectfully pointed out that the structure and technique disclosed by McClurg et al for obtaining values to perform normalization completely differs from the structure recited in independent claim 5 and the method recited in independent claim 16. Indeed, according to McClurg et al, the process shown in Fig. 5A is performed and coefficients are obtained before scanning a fingerprint (the coefficients are obtained and then stored in the manufacturing process of the device for use in future operation - column 5, lines 23-26 and column 7, lines 1-3).

Moreover, according to McClurg et al, after the normalization coefficients are obtained, the device is put into use to scan a fingerprint. In this process, fingerprint image data is obtained in steps 560 and 570, to obtain raw image data from the two-dimensional scanner as shown in Fig. 3B. Then, the

already stored normalization data is added to the raw image data in step 580, and if necessary, the pixel values obtained by adding the normalization coefficients are cut off at the minimum or maximum possible pixel values in step 590, so as to obtain normalized image data for storage, transmission or further processing in step 595. See column 7, line 29 to column 8, line 5.

Still further, it is respectfully pointed out that the portion of McClurg et al cited by the Examiner at the top of page 3 of the Office Action (column 7, line 53 to column 8, line 5) merely relates to "[taking] care ... that the normalized image values do not exceed allowable limits" (see column 7, lines 53-55). That is, according to McClurg et al, for example, if a normalized pixel value would exceed a maximum permissible pixel value, then the normalized value should be set at the maximum permissible value (column 7, line 65 to column 8, line 5). And it is respectfully submitted that this disclosure of McClurg et al at best may relate to the recitation at the last line of claim 5 and the last line of claim 16 (taking a maximum possible pixel value into account when correcting a pixel value).

In contrast to the structure and method disclosed by McClurg et al, the structure and method recited in independent claims 5 and 16 do not require obtaining normalization coefficients by

exposing the sensor to a uniform light source in the manner of the technique shown in Fig. 5A of McClurg et al.

By contrast, according to claims 5 and 16, it is assumed that the shading of the fingerprint image scanned by the line sensor will be obtained commonly in each image pickup element.

That is, according to claim 5, a pixel value detecting unit detects a respective maximum value and a respective minimum value from fingerprint image data output from each of the image pickup elements. See T1 in Fig. 19. In addition, a pixel value range detecting unit detects a pixel value range between the respective maximum value and the respective minimum value detected by the pixel value detecting unit for the fingerprint image data read by each of the image pickup elements. See T2 in Fig. 19. Still further, a normalized data generating unit generates, for each pixel of the fingerprint image data, normalized data that indicates a ratio of a pixel value of the pixel to the pixel value range corresponding to the image pickup element which read the pixel. See T3 in Fig. 19.

Thus, according to claim 5, using the fingerprint data scanned by each image pickup element, the fingerprint data obtained by each image pickup element is normalized.

Moreover, according to claim 5, a normalized data average calculating unit calculates averages, corresponding respectively to the image pickup elements, of the normalized data generated by

the normalized data generating unit from the fingerprint image data read by the respective image pickup elements. See T4 in Fig. 19. And according to claim 5, a pixel value correcting unit corrects a pixel value of each of the pixels of the fingerprint image data based on: (i) the average calculated by the normalized data average calculating unit corresponding to the image pickup element which read the pixel, and (ii) a maximum possible pixel value of the pixels. See T5 in Fig. 19. Thus, the entire image is adjusted.

Independent claim 16, moreover, recites a method corresponding to apparatus claim 5.

By contrast, according to McClurg et al, the normalization coefficients are obtained by exposing the sensor to a uniform light source, before obtaining fingerprint data. Thus, the structure and the method disclosed by McClurg et al clearly differ from the structure and method recited in independent claims 5 and 16.

And as pointed out above, contrary to the Examiner's assertion at the top of page 3 of the Office Action, the disclosure at column 7, line 53 to column 8, line 5 of McClurg et al merely relates to "[taking] care ... that the normalized image values do not exceed allowable limits" (column 7, lines 53-55). This disclosure of McClurg et al does not at all correspond to detecting a pixel value range between the respective maximum

value and the respective minimum value detected by the pixel value detecting unit for the fingerprint image data read by each of the image pickup elements as recited in the manner recited in independent claims 5 and 16. Indeed, as also pointed out above, this disclosure of McClurg et al at best may relate to the recitation at the last line of claim 5 and the last line of claim 16 (taking a maximum possible pixel value into account when correcting a pixel value).

It is respectfully submitted, moreover, that merely substituting a line sensor for the two-dimensional sensor disclosed by McClurg et al, as suggested by the Examiner on page 3 of the Office Action, still would not achieve or render obvious the structure recited in independent claim 5 or the method recited in independent claim 16.

Accordingly, it is respectfully submitted that even if McClurg et al and Horinouchi were combinable in the manner suggested by the Examiner, the resultant combination still would not teach or fairly suggest the structure recited in independent claim 5 or the method recited in independent claim 16.

In view of the foregoing, it is respectfully submitted that independent claims 5 and 16, and all of the claims respectively depending therefrom clearly patentably distinguish over McClurg et al and Horinouchi under 35 USC 103.

Allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned for prompt action.

Respectfully submitted,

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